

# **A Multimedia Reference for Office Management of Shoulder Pain**

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A multimedia development team at Kaiser Permanente in the Northern California Region has developed a just-in-time computer program to aid primary care providers in diagnosing and managing painful conditions of the shoulder.

One unique feature of this program is that it is intended to be a just-in-time system. It has the capacity to retrieve and present desired information in seconds to a couple of minutes. This allows the clinician to use the system during or between patient encounters for immediate consultation with an "expert." This is accomplished by employing a graphical user interface (GUI) to allow the provider to easily navigate through the extensive multimedia content, in order to select the information needed for an office visit. The content has been carefully divided into small discrete pieces arranged in a familiar fashion to allow nonlinear access to this information using the GUI.

This program also features a combination of audio, video, text, and graphic media used to teach diagnostic and therapeutic techniques that are both comprehensive and cost-effective for primary care providers. The approach presented represents a timesaving method of collecting only data needed to sort through the lengthy differential diagnosis of conditions causing shoulder pain. Once the diagnosis is known, then appropriate treatment is discussed, employing resources in an efficient manner. The development team consulted many experts from our primary care, physical therapy, and orthopedic departments to develop the content, thereby establishing a "best practice" for the management of the painful shoulder.

This multimedia program consists of 8 main modules.

The Introduction section introduces the user to the goals of the program and how to navigate through the interface. This is presented upon activation of the program, but may be bypassed at any time.

The other seven modules consisting of the Anatomic Background, History, Physical Examination, Laboratory, Diagnosis/Management, When to Refer, and Case Study sections are always accessible, through representative pictorial icons arranged in a thin bar on the left side of the screen. The user may use these icons to jump to a different module at any time to retrieve new information. The program is designed to be browsed in the same manner that one skims through the content of a reference text. The interface allows navigation through the content to

show basic relationships, and at any time more in-depth information may be selected through hyperlinks.

The Anatomic Background section allows the user to review the anatomy of the shoulder as well as the pathophysiology of the most common disorders.

The History module uses narrated text to remind the provider of the salient clinical features which must be asked of each and every patient who presents with shoulder pain, as well as which diagnoses are related to the presence or absence of this clinical feature.

The Physical Examination section uses narrated text and video demonstrations (of range of motion and location of pain) to show the user how to perform a preliminary exam to exclude disorders of the neck, abdomen, or thorax as a cause of observed shoulder pain. This section also uses narrated text and video demonstrations (of examination maneuvers) to teach mandatory and optional components of a more focused evaluation of the shoulder. The clinical relevance of each examination component is discussed.

The Laboratory module lists those conditions for which lab tests may be useful in either diagnosis or management of painful shoulder conditions, and uses narrated text to discuss at what point these tests should be employed.

The Diagnosis/Management section presents a summary of history, examination, and laboratory features that are key to making a specific diagnosis, and it also teaches appropriate management of the chosen condition. The basic information in this section is presented in text form with frequent hyperlinks to narrated text and video demonstrations (of physical signs, injections, and exercises) for elaboration.

The When to Refer section provides a list of indications for referral to a musculoskeletal specialist and uses narrated text for further discussion.

The Case Study section allows the user to control and instantly view any part of a video of a patient presenting with the most common cause of shoulder pain, the impingement syndrome.

Using the GUI to retrieve these audio, video, text, and graphic media, the clinician can find answers to common clinical questions. This multimedia content forms a comprehensive reference work that is a "best practice" for office management of shoulder pain.